Reader@Express™
Program User's Guide

V1.8.1

August 2013

STAR SYSTEMS INTERNATIONAL

Revision History

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2010080101	003	Initial release	August 2010
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1 Introduction

This document is to describe program to check and test functions provided by IDRO "RFID READER". This program is called as **Reader@Express™** and it is a GUI application to be operated in .NET environment, and it can be used in checking and managing functions of "RFID READER".

The major functions provided by **Reader@Express™** are as follows:

- **Inventory Operations**
  Multiple, Single, Selection, Filtering
- **Access Operations**
  Read, Write, Lock, Kill
- **Accessing and Changing Reader configurations**
- **Controlling and managing Reader including F/W upgrade**

.NET framework version 2.0 above should be installed in the system if necessary for **Reader@Express™**.

IDRO900F "RFID Reader" supported by this program are as follows:

Type	Model Name	TCP/IP	Serial
Fixed	IDRO 900F (REGOR)	O	O

1.1 Reference documents

Document	Document No.
Reader API Guide for .NET Developers V#.#.#	
Reader Control Protocol Specifications Guide V#.#.# - Model Name	

2 Getting Started

Reader@Express™ program consists of 3 major functions.

Function classifications	Name of functions	Descriptions
Basic functions	Reader@Controller™	You can check and test various functions of reader such as inventory, access operations, configurations, etc. by connecting with reader.
Additional functions (Under development)	Reader@Browser™	It controls many readers, and it can upgrade F/W, check conditions, reboot, environment setting, etc by connecting with many readers at the same time.
	Reader@Tester™	It provides reliability tester to test basic functions and life of H/W of reader by preparing test scenario.

IDRO900F (REGOR) "RFID Reader" is supported by this program as follows:

Type	Model Name	TCP/IP	Serial
Fixed	IDRO 900F (REGOR)	O	O

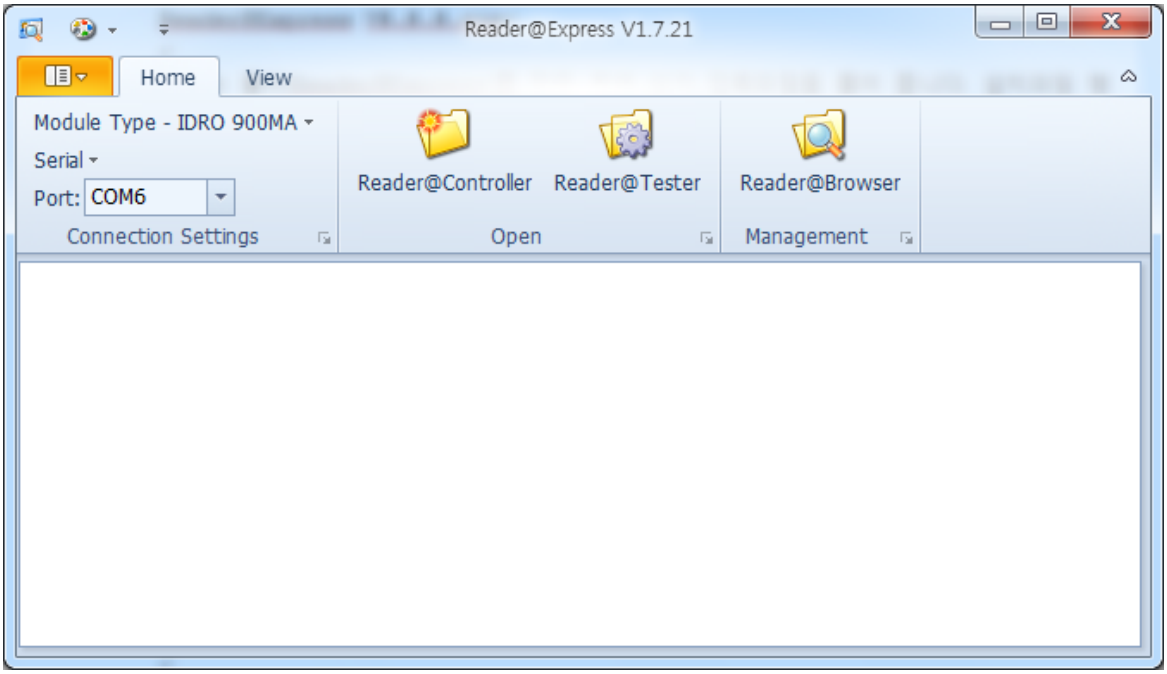
2.1 To execute Reader@Express™ program

This program is distributed in compressed file in the name of as follows.

Reader@Express V#.#.#.zip

After creating desired folder(Example, Reader@Express) and then it extracts above compressed file. If it is distributed in installation file type then install it by executing setup.exe.

If "reader@express.exe" file is executed then following screen appears.



2.2 To connect reader

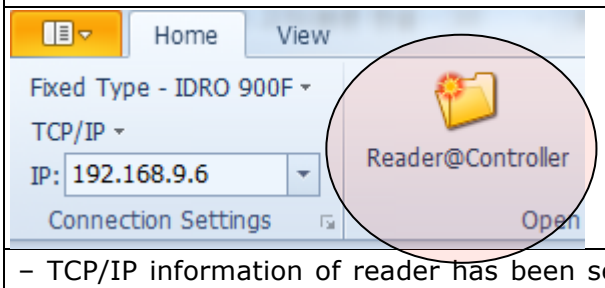
Fixed "RFID reader" supported by **Reader@Express™** program are as follows.

Type	Model Name	TCP/IP	Serial
Fixed 4 port reader	IDRO900F (REGOR)	O	O

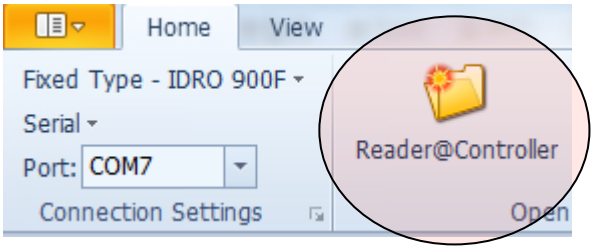
2.2.1 To set connection

The address may be designated as follows:

Setting fixed type product connection
IDRO900F (REGOR)



– TCP/IP information of reader has been set as follows at the time of release of product:
IP : 192.168.9.6, PORT : 5578
– For easy connection, you may change IP address of PC to be connected to "192.168.9.#" temporarily.
– If you want to connect by changing IP address of reader, connect in serial as follows:

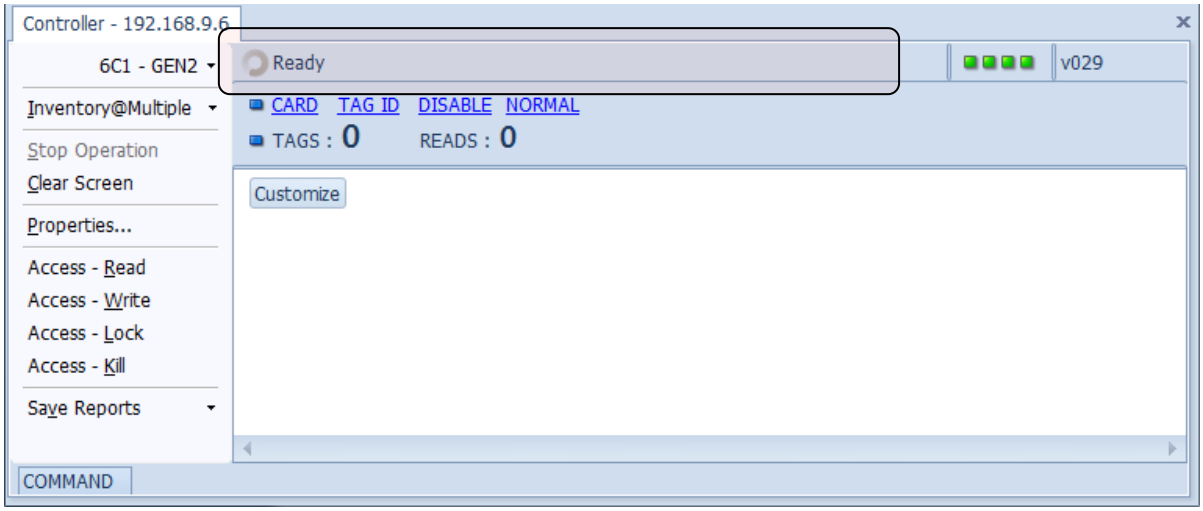


Start connection with reader by clicking "Reader@controller" button.
After changing IP address in **CONNECTIONS TAB** of <Reader properties window>, click "apply" button.

2.2.2 To connect reader

To connect reader after setting connection as previous section,
If "Reader@controller" button is clicked then following screen appears and it is started to connect with reader.

<Reader@Controller Window>



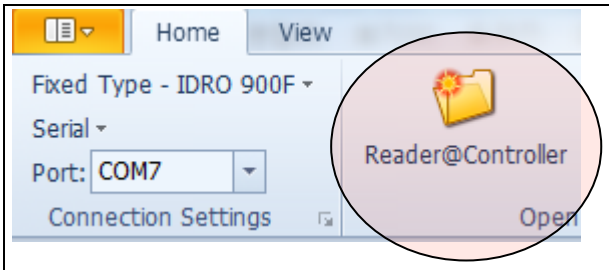
"Connecting…" is displayed as follows during trial of connection and round icon is moving.

If it has been normally connected, then "Ready" is displayed and round icon is moving.

If failed to connect, reason of fail to connect may be displayed as follows and round icon is not moving.

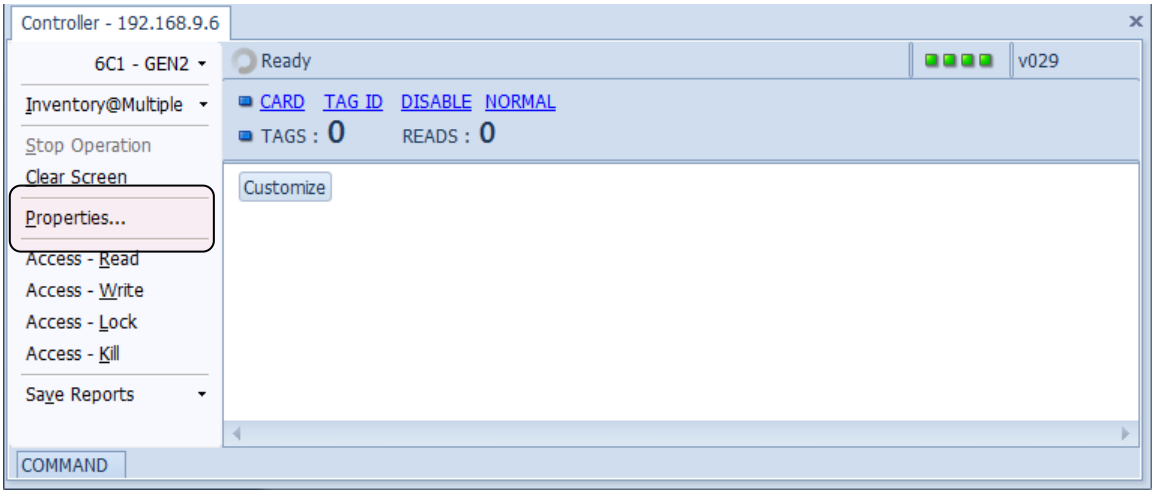
Check reason of fail to connect and solve the problem and then you may restart to connect by clicking "Reader@controller" button. If required, you may close the window by clicking "**X**" icon located on the right upper side.

2.2.3 To change IP address of reader– Fixed Type

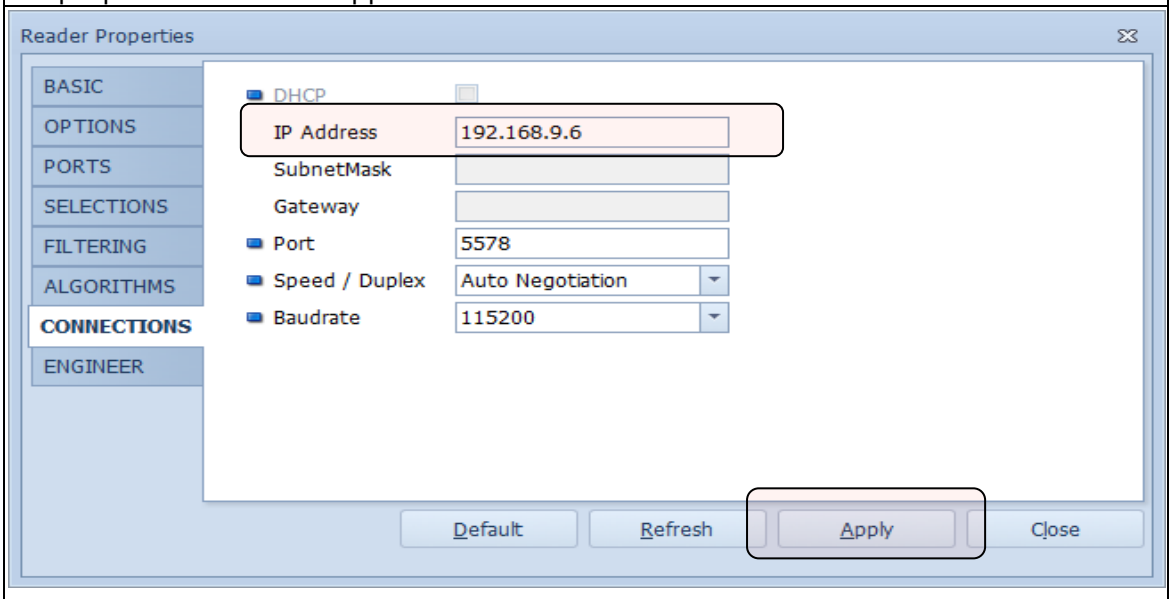


- If you want to connect by changing IP address of reader, set in serial as shown on the left side.
- If "Reader@controller" button is clicked then it starts to connect.

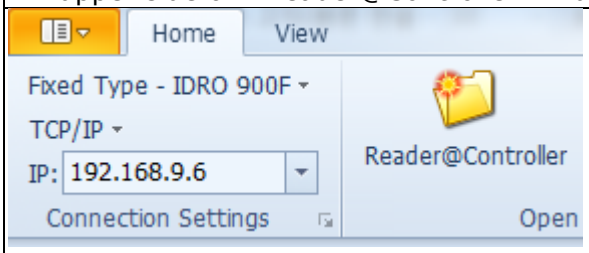
- If connection is completed then <Reader@Controller window> appears as follows.



- If "Properties…" button is clicked on the left menu panel then <Reader properties window> appears.



– After changing IP address in **CONNECTION TAB**, click "Apply" button.
– If required, you may close window by clicking "**X**" icon located on the right upper side of <Reader@Controller window>.

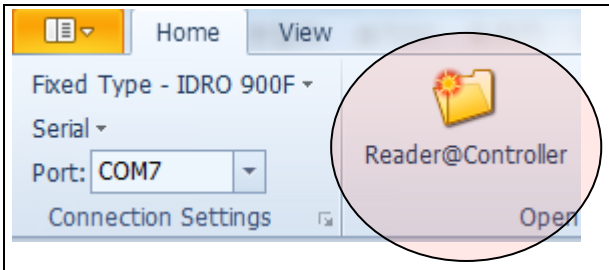


– Set connection type to TCP/IP as shown on the left side, after inputting changed IP address, start connection again with reader by clicking "Reader@Controller" button.

3 To use Reader@Controller window

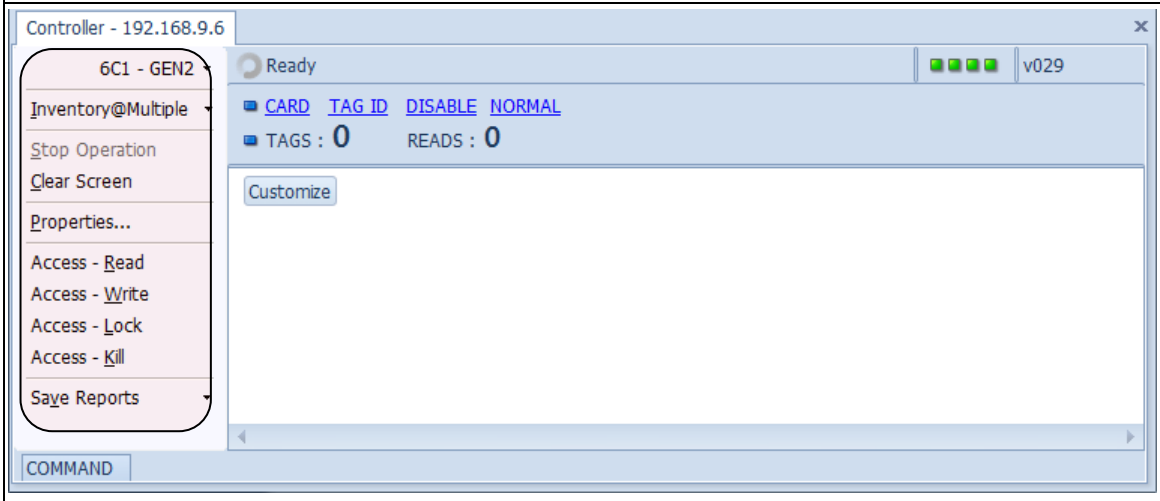
In order to check various functions of reader such as inventory, access operations, configurations…, etc. by connecting with reader,
use <Reader@Controller window>.

Designate purchased model type, connection type, address,
and if "Reader@Controller" button is clicked then <Reader@Controller window> appears as follows:



- It is an example of connection setting for connection of fixed type reader in serial.
- If "Reader@Controller" button is clicked then it is started to connect with reader.

- If connection is completed, then <Reader@Controller window> appears as follows.



<Reader@Controller window> provides following functions through on the left menu panel.

- Inventory Operations
  Multiple, Single, Selection, Filtering
- Access Operations
  Read, Write, Lock, Kill
- Accessing and Changing Reader configurations

3.1 Run / Stop Inventory

Execute inventory in order to read tag ID. Reader executes to read tag according to the inventory type and reports tag ID to host device of PC, etc.

Tag readings (Inventory) of following 4 kinds are provided:

Inventory Type	Descriptions
Multiple	– It is used when to read many tags continuously.
Single	– It is used when to read minor(2~3) tags continuously.
Selection	– It reads by selecting only those tags meeting conditions among many tags. – To set selection condition □ If "Properties…" button is clicked, □ <Reader properties window> appears. □ Set conditions on the **SELECTIONS TAB**.
Filtering	– After reading tags, it reports only those tags meeting conditions to host device of PC, etc. – To set filtering condition □ If "Properties…" button is clicked, □ <Reader properties window> appears. □ Set conditions on the **FILTERING TAB**

– Reader is continuously conducting to read tag during conducting inventory. And, if **Continue Mode** attribute items are not set, it may stop automatically to conduct inventory after reading tag once only.

– **To Set Continue Mode**
- □ If "Properties…" button is clicked,
- □ <Reader properties window> appears.
- □ Set **Continue Mode** on the **OPTIONS TAB**

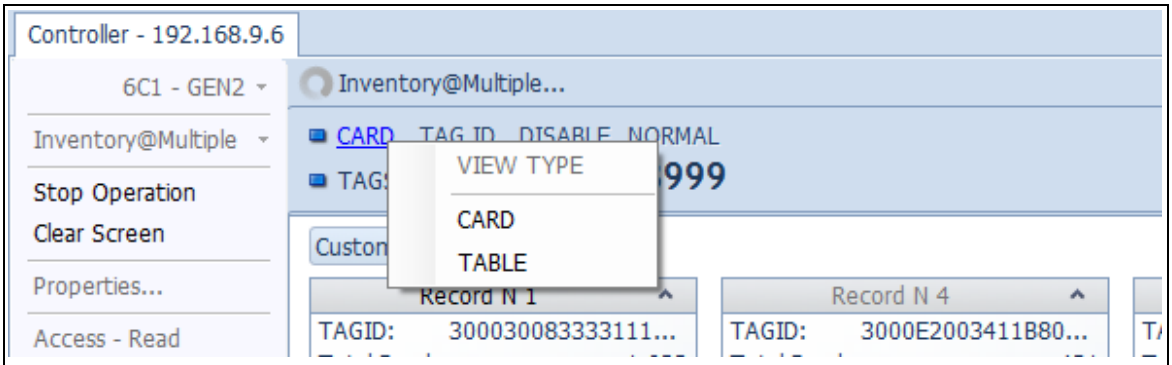
– If "Inventory@multiple" button is clicked then multiple inventories are executed.

– In order to change inventory type, click down arrow located at the right side end of "inventory@type" button.
Type may be designated on the appeared menu.

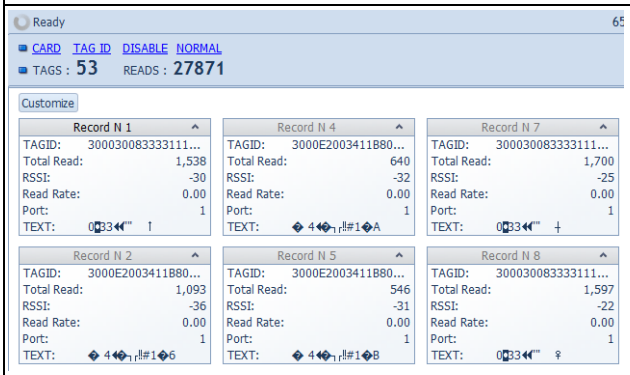
– In order to stop inventory, click "Stop inventory" button.

3.2 To change View Type

Displaying form of read tags on the screen may be designated.



– If CARD link is clicked, view type selection menu appears as shown above.
– You may change in real time even during inventory.



CARD VIEW

– Information of read tags in basic view type is displayed in card form on the screen.
– It is mainly used for applications to trace tags.

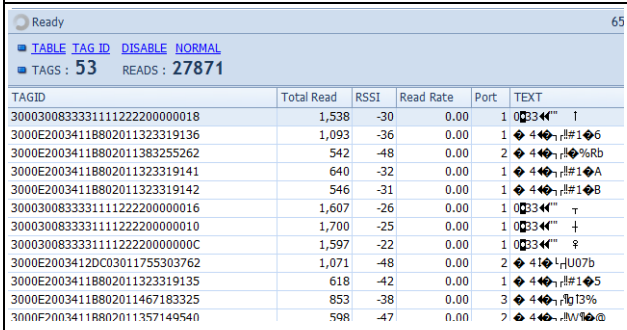


TABLE VIEW

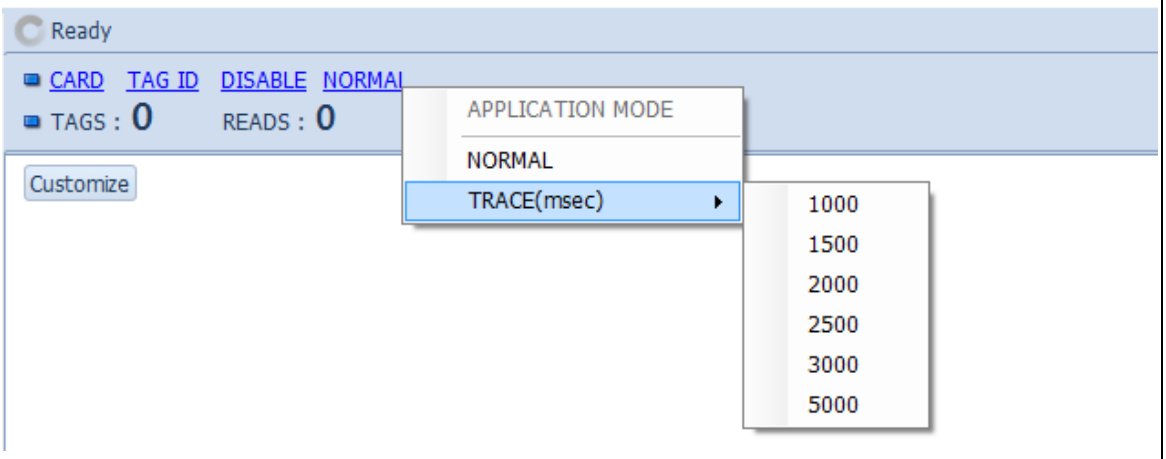
– Information of read tags is displayed on the screen in table form.
– It is mainly used in order to check information of read tags in details.

3.3 To trace tags

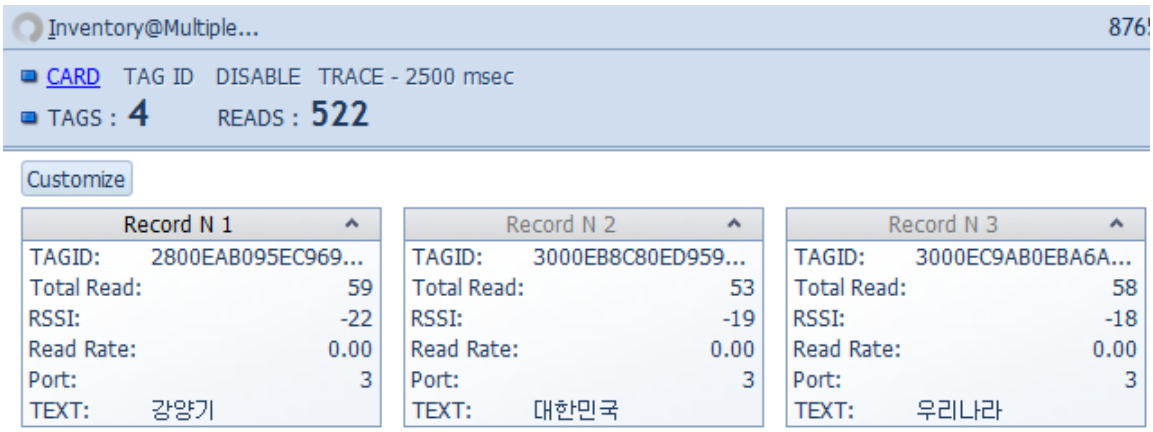
If new a tag is recognized in "**Normal mode**", it is displayed only in the form to add to the table but it is not processed separately.

However, if tags are not recognized during set time in "**Tag trace mode**", a process to remove relevant tags from the table is separately conducted. The existence of tag in the specified space appears on the screen by tracing in real time.

– If NORMAL link is clicked, trace time selection menu appears as below.
– Select desired trace time.



–Start to trace tags by clicking "Inventory@Type" button.

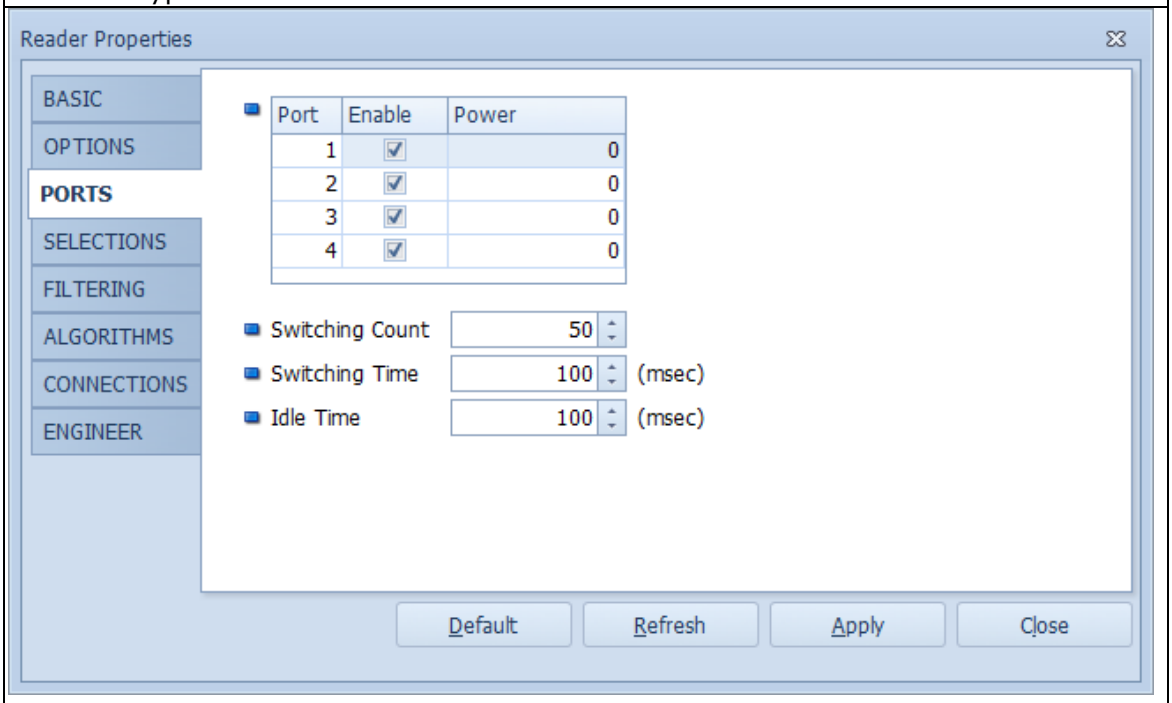


– You may check dynamically the existence of tags by setting view type in card form as shown above.

3.4 To set reader properties

Operation of reader may be adjusted by changing transmission power level, option, inventory condition, etc.

- If "Properties…" button is clicked on the left menu panel of <Reader@Controller window>, <Reader properties window> appears as shown below.
- Contents of displayed attributes may vary according to model type of reader. Fixed type reader is shown as below.



- Setting button

Apply button : Applies changed attributes.

Refresh button : Displays again attributes set in the reader.

Default button : It initializes to basic values set at the time of release of product.

Save button : It makes to apply permanently contents set in the functions existed only in the module type product. It maintains set values even after power switched off.

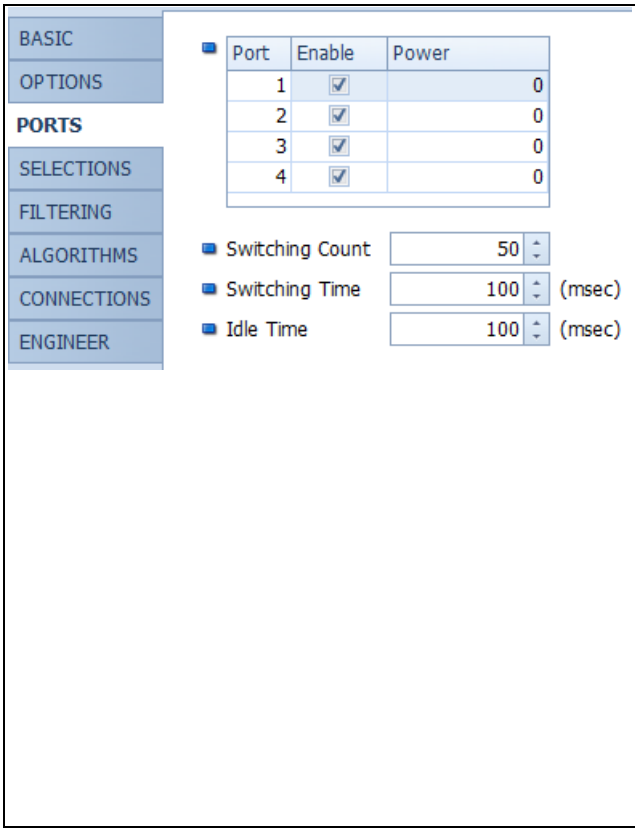
3.4.1 To change transmission power level

– Set power items in the **BASIC TAB** as follows.
And, power can be set for each port on the **PORTS TAB**.
Power set value for each port is 0 then it works with power set value on the **BASIC TAB**.

Power	300	290	280	…	0
[dBm]	30	29	28	…	0

3.4.2 To set antenna port

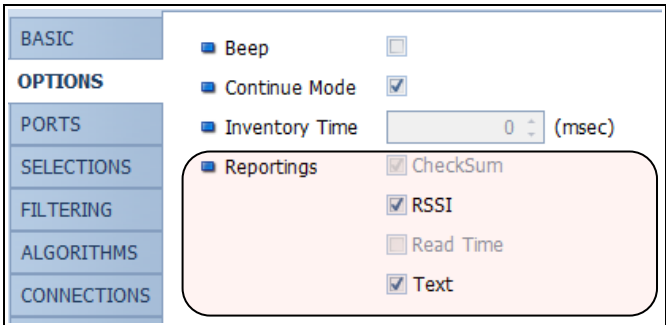
After connection of antenna to be used in reader, designate in the **PORTS TAB** as follows.



– **Designate use or no use**
Designate in Enable column.
– **Switching Count**
Designate the time operating in each antenna port with number of times. It is applied only when "Switching time" value is set to "0".
– **Switching Time**
Designate the time to operate in each antenna port.
– **Idle Time**
After operation during switching time, designate the time to stop operation. It is used to minimize the interference between readers or to prevent overheat. For module type, this attribute can be designated on the **ETC TAB**.

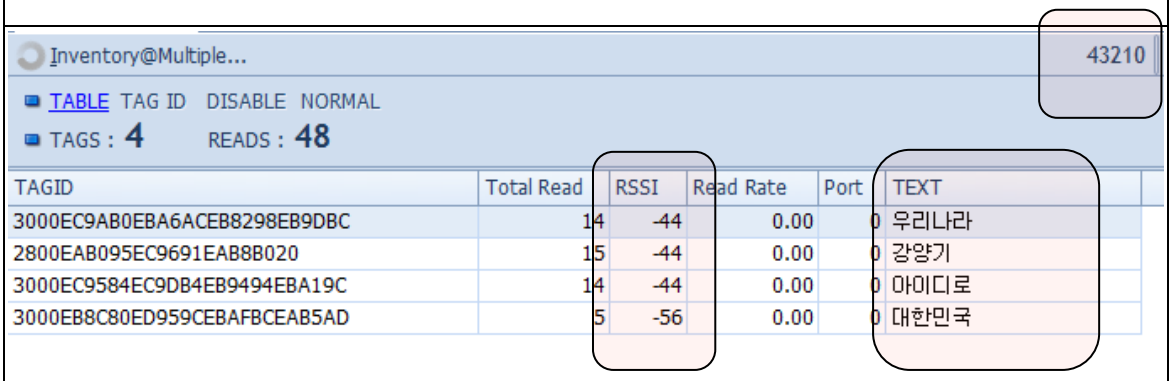
3.4.3 To set Reporting Option – RSSI, TEXT DECODING, …

If it recognizes tag during conducting inventory, reader reports tag information to host device of PC, etc. In this case, the information such as RSSI, TEXT DECODING, … can be added additionally.



- **CheckSum**
  Designate whether to add CheckSum field at the time of reporting tag memory (Inventory, read operation). It cannot be changed at present time.
- **RSSI**
  Designate whether to add strength of receiving signal.
- **TEXT**
  Designate whether to decoding process of tag memory value with UTF-8. When in write operation, it can encode tag memory with UTF-8.

– Apply setting by clicking "Apply" button.
– After clicking "Close" button and closing window, click "Inventory@Type" button.

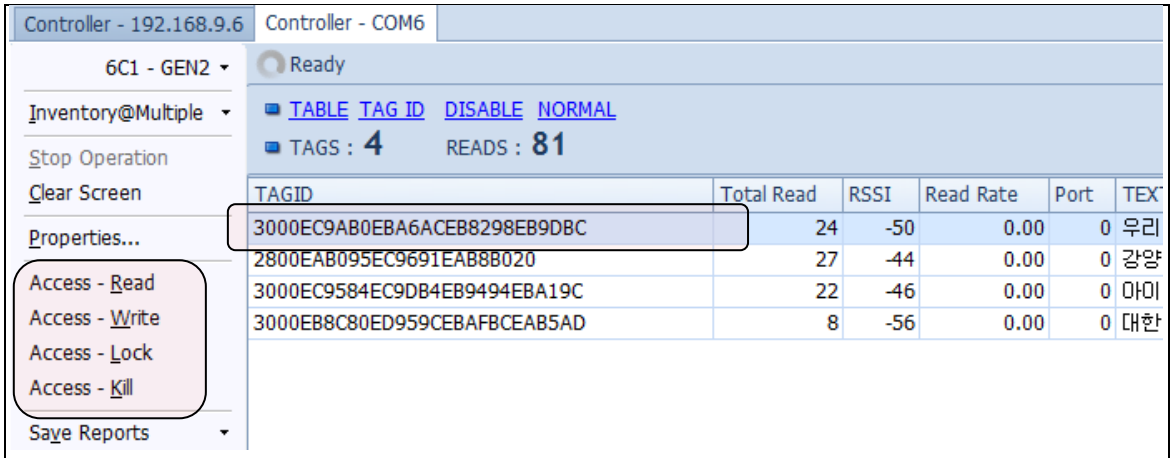


TAGID	Total Read	RSSI	Read Rate	Port	TEXT
3000EC9AB0EBA6ACEB8298EB9DBC	14	-44	0.00	0	우리나라
2800EAB095EC9691EAB8B020	15	-44	0.00	0	강양기
3000EC9584EC9DB4EB9494EBA19C	14	-44	0.00	0	아이디로
3000EB8C80ED959CEBAFBCEAB5AD	5	-56	0.00	0	대한민국

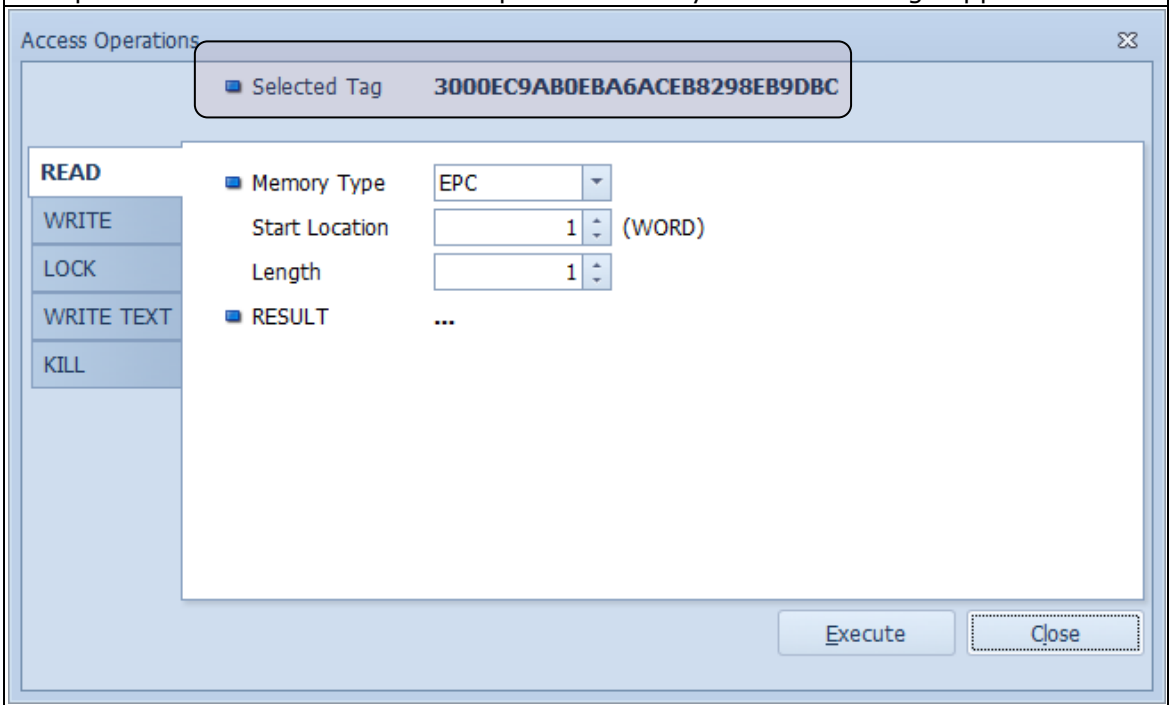
– Receiving signal strength (RSSI) of each tag is displayed in the "RSSI" column, strength is displayed by figuring into characters on the right upper side.
Range : -110(0) ~ 0(9876543210)
– Decoded result of tag memory value in UTF-8 is displayed in TEXT column.

3.5 To access to tag memory – Access Operation

It provides the function to directly access to and operate specific memory bank of tag. And, you can use selection function to select and operate specific tag only among many tags to meet the condition.



- If "Access-type" button is clicked on the left menu panel then <Access operations window> which can operate memory for any tag appears.
- If specific tag ID display on the table is double clicked then <Access operations window> which can operate memory for selected tags appears.



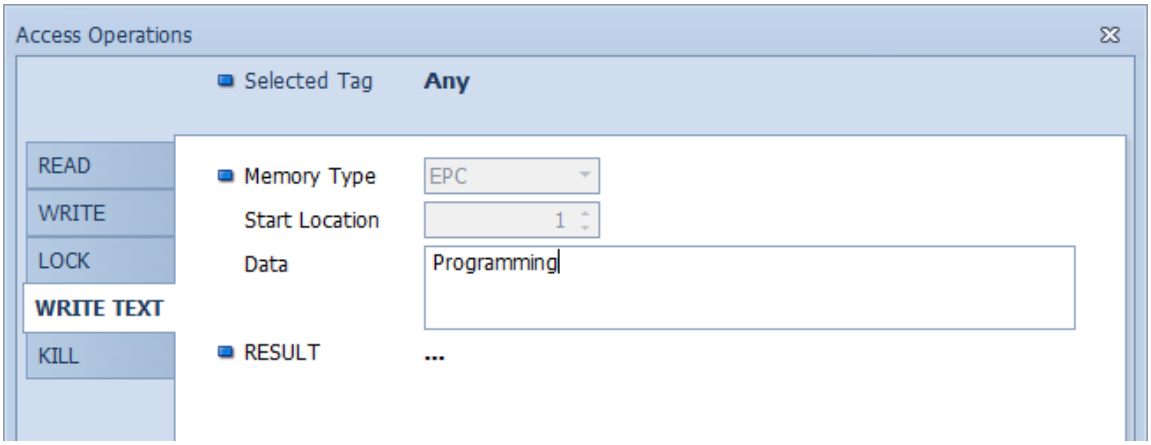
- If specific tag is selected, tag ID is displayed at upper part as shown on the above picture, if it is any tag then it is indicated as "Any".
- If anything required is set and "Execute" button is clicked, relevant access operation is executed, and the result is displayed in "RESULT" item.

3.5.1 To write text string – TEXT ENCODING

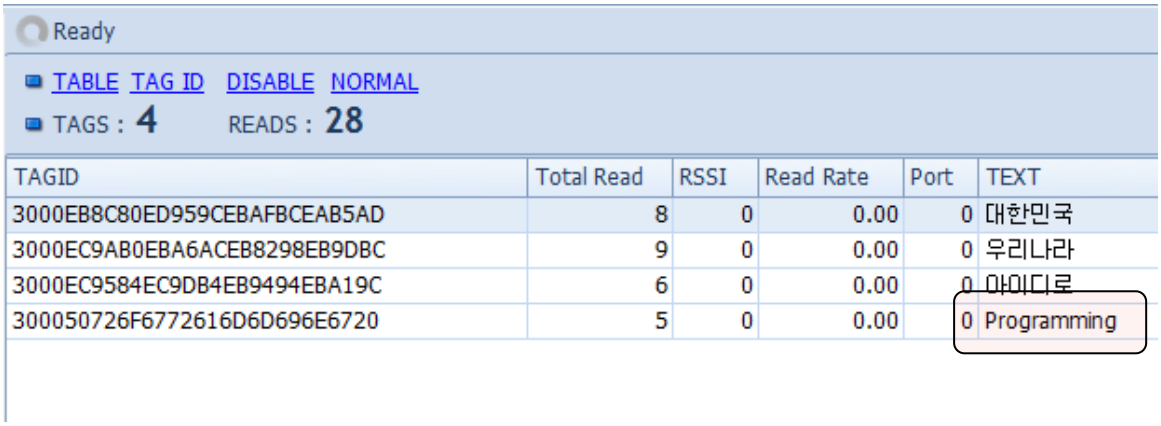
On the **WRITE TAB**, you can conduct to write in specific memory bank by inputting value in HEX type in "Data" items.

On the **WRITE TEXT TAB**, it provides function to write in the specific memory bank by inputting value direct text string in non-HEX type. Text string inputted by user are encoded in UTF-8 and recorded in the tag memory.

- If text string to be written as following picture and "Execute" button is clicked, it is encoded in UTF-8 and recorded in the tag memory.



- After closing window by clicking "Close" button, click "Inventory@Type" button.
- Decoded result of read tag memory value in UTF-8 can be checked in TEXT column as follows.



TAGID	Total Read	RSSI	Read Rate	Port	TEXT
3000EB8C80ED959CEBAFBCEAB5AD	8	0	0.00	0	대한민국
3000EC9AB0EBA6ACEB8298EB9DBC	9	0	0.00	0	우리나라
3000EC9584EC9DB4EB9494EBA19C	6	0	0.00	0	아이디로
300050726F6772616D6D696E6720	5	0	0.00	0	Programming

To use Tag@Writer Window

Use Tag@writer to write wanted values on tag memory conveniently.

Available for writing numerous memory values of tags in order, and Tag@writer supports the following main functions.

Tag@Writer main function
Auto-writing mode for the followed tag
Retry function when the tag write is failed
Verification function for written data

Use Tag@writer as following procedure.

- ▼ First of all, Save extra file for the data to write.
- ▼ Connect with reader
- ▼ Import the file through "Open" dialogue box. The loaded data in the file should be shown on the screen as a table form.
- ▼ Start to write by using the writing tool in the menu panel on top the screen.

→ For reference, In case of writing 1~2 tags
It might be more useful to use "**Access – Write**" instructed at "**3.5 To access-tag memory – Access Operation**"

4.1 Make out "data value" to write

Make the data value to write by using note pad, and Save it as a text file(*.txt)

ISO18000 6C GEN2 tags support the following 3 memory territories, so write down each territory with dividing by Tap.

ISO18000_6C_GEN2 tag : Memory territory		
EPC	The territory for saving Tag ID	1st column
User	The territory for saving optional user data	2nd column
Reserved	The territory for saving Access password	3rd column

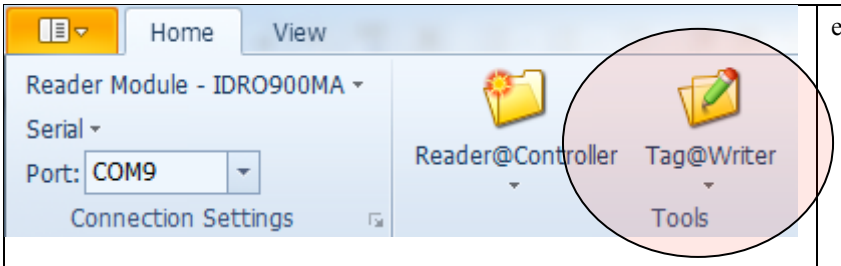
Write value with reference to the following sample files provided with **Reader@Express™** program

Sample file	
WriteValue(epc).txt	- In case of writing EPC territory
WriteValue(epc,user,pwd).txt	- In case of writing all the territories EPC, User, Password
WriteValue(epc text).txt	- In case of writing text data in EPC territory - Recoded by being encoded as UTF-8 - Able to check the file as a text type in the **Reader@Express™** program - Only available for EPC territory
WriteValue(epc random).txt	- In case of writing by generating 96-bit random data in the EPC territory - Only available for EPC territory

→ Write down each memory value as Hex type and separate them by Tap.
→ In not case of writing value, mark it as "void".
→ represent "EPC, User, Reserved territory" from the first column to the end.
→ Microsoft Excel is useful to writing the numerous data. However, notice that the file should be loaded as "text type(divide them with Tap)"for the file form.

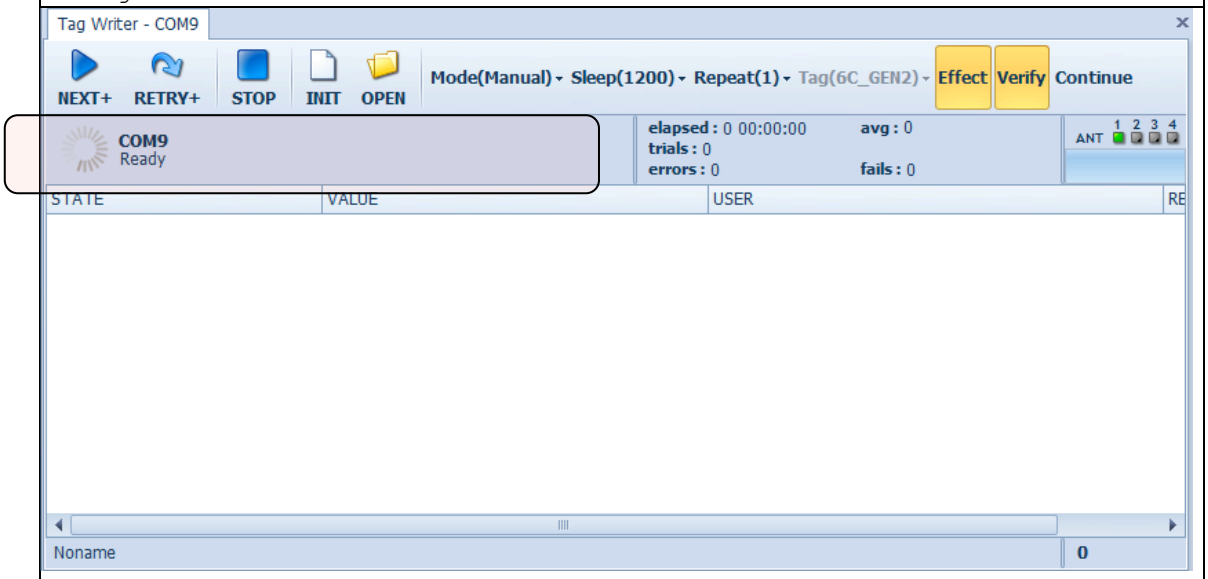
4.2 To connect Tag@Writer

After Setting the purchased model type, connection type and address, Clicking "Tag@Writer" button, <Tag@Writer Window> will be appeared.



example) setting of Connection with the module type reader by serial.

– When clicking **"Tag@Writer" button**, the connection with the reader starts.
–<Tag@Writer Window> will be shown when the connection is finished.



– When the connection works normally, "Ready" will be featured and the circle Icon is spinning.
– In case of failing to be connected, the reason of fail will be shown and the circle Icon is not spinning.
In this case, after checking the reason of connection, restart connection by clicking **Tag@Writer"button** again.
Needed to close the screen, click the 'x' Icon on the right top of it.

4.3 To start tag writing – passive mode

[STEP 1] – Import file

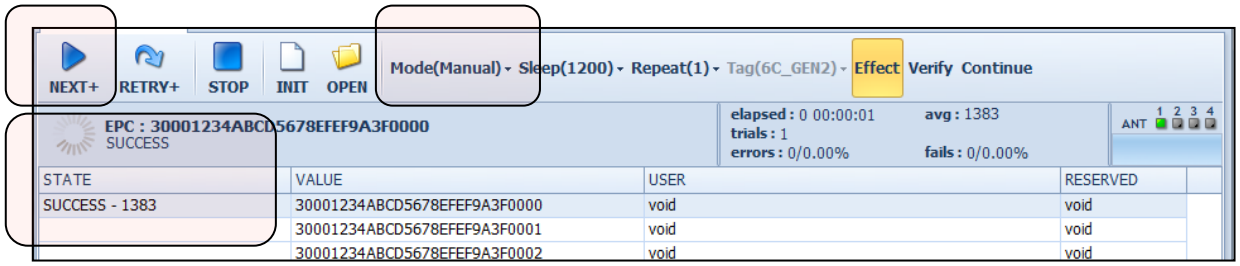
First of all, import file loaded data values to write.

At the top of the screen, menu panel, dialogue box will be open **when you click [OPEN]**. After that, choosing the file to write, the data will be featured as a table type on the screen.

[STEP 2] – Start to write

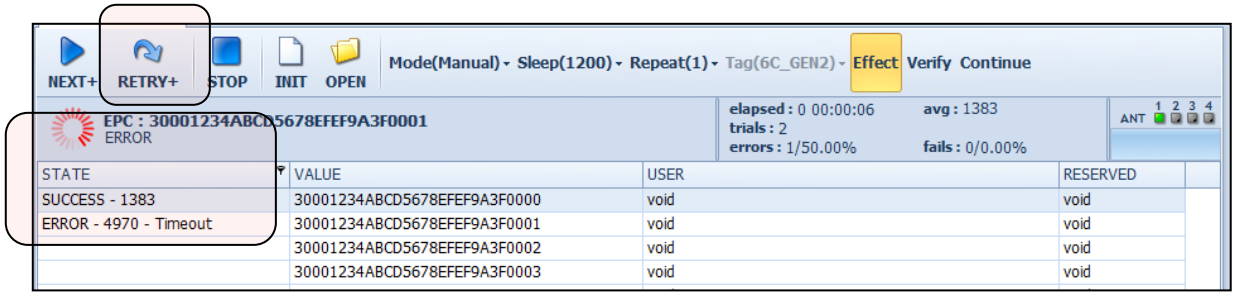
Put the tag needed to be written on the reader, click **[NEXT+] button.**

In case of tag writing success, you will see the following screen.(SUCCESS – 1383)



If you want to start writing next tag, as above,
Put the tag needed to be written on the reader, click **[NEXT+] button.**

In case of failing to write tag The screen will be shown as following picture.



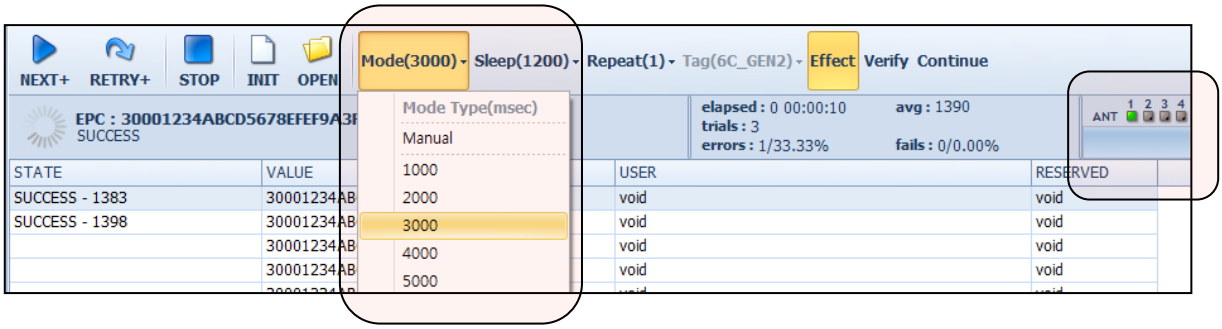
In case of fail, try again by clicking **[RETRY+]**

[STEP 3] – To use Option function

→ By clicking **[Effect] button,** able to turn on and off the sound effect.
→ By clicking **[Verify]button,** able to verify the written value. Don't have to set Tag@Writer(The reader verifies it autonomously.
→ By clicking **[INIT] button**, able to initialize the states. STATE column will be erased and the position of writing clause will be moved to the start position.

4.4 To start tag writing – Auto mode

After the tag writing is finished, **NEXT tag writing can be started automatically.**
In other words, Don't have to click [NEXT+]button each time. Able to
Set the preparing time for the next tag, Tags can be written automatically after the set time is passed.



Above picture is showing the case of setting the preparing time for 3 seconds. After passing 3 seconds, it starts to write the next tag automatically. You can check the time passes at the progress bar on the right top.

→ By clicking **[STOP] button,** The tag writing can be stopped. It stops after the clauses on the current process are finished.

→ By clicking **[Sleep] button**, Readers are able to be set the time to rest In case of using numerous tags or using all the memory territories for one tag, reader can generate heat and let fall the performance.
Basically 300ms is set.

TECHNICAL SUPPORT

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